

THERMOBARIC MOLECULAR FRACTIONATION

ABSTRACT

Systems and methods for converting organic material into commercially viable products, such as burnable low sulfur engine fuels. The system of the present invention includes an anaerobic stripping reactor for processing organic materials into a bio-softened slurry, a thermobaric cracking chamber and expansion/separation tank for converting the bio-softened slurry into products, and a hydrocarbon separation system for separating the various products. An interfusion system can be provided that selectively combines various of the products to create fuels, such as diesel or gasoline. In one embodiment, the thermobaric cracking chamber operates approximately in the ranges of 350 to 600° F and 400 to 1,200 psig. In a specific embodiment, the anaerobic stripping reactor is segregated into three areas to create buffer zones both into and out of the anaerobic stripping reactor, thus isolating a main portion of the organic material from reactive shocks. Varying the organic material input into the system, and/or the temperature and/or pressure of the thermobaric cracking chamber and/or the dwell time of the organic material in the thermobaric cracking chamber allows the end product of the system to be manipulated and controlled.